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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,730	07/24/2003	Mikio Wakamiya	240564US0DIV	8065
22850	7590	11/08/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			HUYNH, ANDY	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/625,730	Applicant(s) WAKAMIYA, MIKIO	
	Examiner Andy Huynh	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2004.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 18-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 24-29 is/are allowed.  
6) ☒ Claim(s) 18-23 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 12 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09/520,959.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/25/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

In the Amendment dated 10/12/2004, claims 1-17 are canceled, Figs. 1A-B, Figs. 2A-B and claims 18-21 are amended, and new claims 23-29 are added are acknowledged. Accordingly, claims 18-29 are currently pending in the application.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 18-23 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Information Disclosure Statement***

This office acknowledges receipt of the following items from the applicant: Information Disclosure Statement (IDS) filed on 06/25/2004. The references cited on the PTOL 1449 form have been considered.

#### ***Claim Rejections - 35 U.S.C. § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Horii Tadashi (JP: 64-047055), Applicant submitted prior art (ASPA).

Art Unit: 2818

Regarding claims **18 and 23**, Horii Tadashi discloses in Figs. 1-5 and the corresponding texts as set forth in English Abstract, a method of manufacturing a semiconductor device comprises:

forming an insulating film (2) on a semiconductor substrate (1);

forming a conductive film (3) on the insulating film;

forming a nitrogen-containing oxide film/a silicon oxynitride layer (5) over the semiconductor substrate, the insulating film, and the conductive film;

forming a boron-doped phosphorus silicate glass (BPSG) film (6) after the nitrogen-containing oxide film/the silicon oxynitride layer; and

carrying out a heat treatment on the BPSG film in an oxidizing atmosphere.

Regarding claim **22**, Horii Tadashi discloses the method wherein the oxidizing atmosphere contains water vapor as set forth in English Abstract.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **19-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii Tadashi (JP: 64-047055), Applicant submitted prior art (ASPA), in view of Arghavani et al. (USP: 6,261,925 hereinafter referred to as "Arghavani").

Art Unit: 2818

Regarding claims **19-21**, Horii Tadashi discloses all limitations except for the method wherein forming a nitrogen-containing oxide film includes carrying out a heat treatment in a dinitrogen monoxide ( $N_2O$ ) gas or a nitric monoxide (NO) gas. Arghavani teaches that using an  $N_2O$  ambient reacts with more of the surface than using just a nitrogen plasma and therefore creates a better and more substantial oxy-nitride surface to prevent stresses and also creates a silicon-oxy-nitride interface between the sidewall oxide and silicon semiconductor substrate that will acts as a barrier and prevent dopant outdiffusion from the active region as set forth in column 6, lines 19-25. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to form a nitrogen-containing oxide film including carrying out a heat treatment in a dinitrogen monoxide ( $N_2O$ ) gas, as taught by Arghavani in order to reduce and to prevent dopant outdiffusion from the active region.

***Allowable Subject Matter***

Claims **24-29** are allowed. The following is a statement of reason for the indication of allowable subject matter:

Claims **24-29** are considered allowable since the prior art made of record and considered pertinent to the application's disclosure do not teach or suggest the claimed limitations. Horii Tadashi and Arghavani do not teach the claimed invention a method of manufacturing a semiconductor device comprises forming a nitrogen-containing oxide film in the absence of hydrogen as recited in independent claim **24**.

***Conclusion***

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy Huynh, (571) 272-1781. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The Fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the -status of this application or proceeding should be directed to the receptionist whose phone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ah

Andy Huynh

11/01/04

Patent Examiner